DETAILED ACTION

Response to Amendment

Claims 1-13 are pending.

Claims 1-13 are rejected.

In view of the amendment, filed on 07/23/2008, following rejections/objections are withdrawn from the previous office action, mailed on 04/08/2008, for the reason of record.

- Objection of drawings
- Objection of claims 2 and 12
- Rejection of claims 1-6 and 9-13 under 35 U.S.C. 112, second paragraph
- Rejection of claims 1-2 and 4 under 35 U.S.C. 102(b) as being anticipated by Yamamoto (JP 09-20828)
- Rejection of claims 1-3 and 6 under 35 U.S.C. 102(b) as being anticipated by Fields et al. (US 6,224,805)
- Rejection of claim 5 under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (JP 09-20828) in view of Rawlings et al. (US 4,517,138)
- Rejection of claims 3 and 6 under 35 U.S.C. 103(a) as being unpatentable over Yamamoto ('828) in view of Ishihara et al. (JP 63-170402)

- Rejection of claims 7-8 under 35 U.S.C. 103(A) as being unpatentable over Yamamoto ('828) in view of Walter et al. (US 2,935,762)
- Rejection of claims 9-13 under 35 U.S.C. 103(a) as being unpatentable over Yamamoto ('828) in view of Fields et al ('805)

New Grounds of Rejection

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims **7 - 8** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites the limitation "the direction of the at least one reactor" in the fourth and seventh lines of the claim. There is insufficient antecedent basis for this limitation in the claim because prior to the cited limitation, claims 7 and 1 fail to clearly define "a direction" for the reactor.

Claim 7 recites the limitation "the direction of the at least one apparatus" in the fourth and seventh lines of the claim. There is insufficient antecedent basis for this limitation in the claim because prior to the cited limitation, claims 7 and 1 fail to clearly define "a direction" for the apparatus.

Claim 8 recites "the mean average pipe diameter in the first section and the mean average pipe diameter in the second section have a ratio of from 1:1 to 10:1" which renders the claim indefinite because the claim fails to clearly define if the ratio of 10:1 is for the mean average pipe diameter in the first section divided by the mean average pipe diameter in the second section or vice versa.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (JP 9-20828) in view of Cleland (US 3,052,664).

Yamamoto (JP '828) discloses a batch-type polymerization apparatus (20) for the production of polymer in which the apparatus include a polymer reactor (1) for the batch-wise preparation of a melt of thermoplastic polymer, a cooling pipe (6) as a piping system for transferring the polymer, and a pelletizer device (4) as an apparatus for the production of polymeric pellets from the melt of a polymer, wherein the reactor (1) and the pelletizer device (4) are connected to the piping system (6). (See figure 1; paragraphs [0009]—[0012]) Furthermore, Yamamoto (JP '828) discloses the pelletizer device (4) as an apparatus for the production of shaped bodies from the melt which is a granulator.

However, Yamamoto (JP '828) fails to teach the piping system forms a circuit, as claimed in claim 1, and also fail to teach a conveying device for moving the melt, as claimed in claim 3.

In the analogous art, Cleland (US '664) teaches an apparatus for polymerization of vinyl aromatic compounds in which the apparatus comprises a heater pipe (6), a cooler pipe (7), and pipes (8, 9, and 11), all together, as a circuited piping system, a circulating pump as a conveying device, a hopper (18), a vibrat-able chute (19), a storage tank (15), a flow meter (17), a valve line (16), a mixing funnel (14) as a reactor connected to the piping system circuit through an input line (13), and a cooler (20) with a filter (21) which are

connected to the piping system through draw off line (12). (See lines 33-75, column 4 and figure 1)

Furthermore, Cleland (US '664) teaches the advantages of providing a piping system circuit for the polymerization apparatus in order to provide a uniform agitation at a sufficient time to convert all of the monomers to high molecular weight polymer. (See lines 33-45, column 4)

Therefore, it would have been obvious for one of ordinary skill in the art at the time of applicant's invention to modify the apparatus for producing shaped bodies as taught Yamamoto (JP '828) through providing a circuited piping system with a conveying device in order to provide a uniform agitation at a sufficient time into the melt of monomers to convert all of the monomers to high molecular weight polymer, as suggested by Cleland (US '664)

Claims 1-3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fields et al. (US 6,224,805) in view of Cleland (US 3,052,664)

Fields et al. ('805) discloses an apparatus for formation of optical plastic sheet in a continuous fashion from molten polymer in which the apparatus include a source (10) as a reactor, a channel (12) as a piping system, further, an overflow die (20) and guiding means (31, 32, 33, and 34) as a shaping apparatus wherein the piping system is connected to the reactor (10) and the shaping apparatus (20) and also the piping system is located there-between and further, a delivery means (14) as a conveying device which moves the

polymeric melt between the reactor (10) and overflow die (20). Furthermore, the prior art teaches the shaping apparatus (20) with guiding means (31, 32, 33, and 34) are an apparatus for producing a plastic film. (See lines 58-67, column 3; and lines 1-11, column 4; figure 2)

However, Fields et al. (US '805) fail to teach the piping system forms a circuit, as claimed in claim 1.

In the analogous art, Cleland (US '664) teaches an apparatus for polymerization of vinyl aromatic compounds in which the apparatus comprises a heater pipe (6), a cooler pipe (7), and pipes (8, 9, and 11), all together, as a circuited piping system, a circulating pump as a conveying device, a hopper (18), a vibrat-able chute (19), a storage tank (15), a flow meter (17), a valve line (16), a mixing funnel (14) as a reactor connected to the piping system circuit through an input line (13), and a cooler (20) with a filter (21) which are connected to the piping system through draw off line (12). (See lines 33-75, column 4 and figure 1)

Furthermore, Cleland (US '664) teaches the advantages of providing a piping system circuit for the polymerization apparatus in order to provide a uniform agitation at a sufficient time to convert all of the monomers to high molecular weight polymer.

Therefore, it would have been obvious for one of ordinary skill in the art at the time of applicant's invention to modify the apparatus for producing shaped bodies as taught Fields et al. (US '805) through providing a circuited

piping system in order to provide a uniform agitation at a sufficient time into the melt of monomers to convert all of the monomers to high molecular weight polymer, as suggested by Cleland (US '664)

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (JP '828) in view of Cleland (US '664), as applied to claims 1-4 and 6, and further in view of Rawlings et al. (US 4,517,138)

Combined teachings of Yamamoto (JP '828) in view of Cleland (US '664) teach all the structural limitations of batch-type polymerization apparatus as discussed above in rejection of claims 1-4 and 6, however, fail to teach the apparatus for the production of thermoplastic articles is a spinning apparatus.

In the analogous art, Rawlings et al. ('138) teach an apparatus for spin casting polymeric articles such as lenses in which the apparatus include a plurality of mold (8), a polymerization tube (2) in which an interference fit be maintained between the molds and the tube to insure concentricity of the molds to the spin axis of the tube in which spinning will cause the composition, under the centrifugal force to conform the shape of the cavity (10) in mold (8). (See 1 - 20, column 10; lines 16-24, column 13) Further, prior art discloses the spin casting apparatus produces small plastic articles with high precision and exact predetermined specifications. (See lines 39-43, column 3)

Therefore, it would have been obvious for one of ordinary skill in the art at the time of applicant's invention to modify the apparatus taught by combined teachings of Yamamoto ('828) in view of Cleland (US '664) through

providing a spinning device for the production of the thermoplastic articles in order to produce a small plastic articles with high precision and exacting predetermined specifications, as suggested by Rawlings et al. ('138)

Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto ('828) in view of Cleland (US '664), as applied to claims 1-4 and 6, and further in view of Walter et al. (US 2,935,762)

Combined teachings of Yamamoto ('828) in view of Cleland (US '664) teach all the structural limitations of batch-type polymerization apparatus as discussed above, however, fail to teach the mean average diameter of the pipe at the connection between the reactor and the piping system is equal to or greater than the mean average diameter of the pipe at the connection between the mold and the piping system, as claimed in claim 7. Furthermore, the mean average pipe diameter ratio at the connection between the reactor and the piping system divided by the mean average pipe diameter of mold apparatus and the piping system is in the range of 1:1 to 10:1, as claimed in claim 8.

In the analogous art, Walter et al. ('762) teach an apparatus for forming molded sponge plastic articles in which the apparatus include a tower (14) as a reactor, which contain plastisol (14) material, conduit (18) to convey the gassed plastisol which exit the tower, Pump (19), a bypass valve (21) which is installed in line (22) to recirculate the plastisol when it is not being injected into molds, a pipe (28) to transfer the plastisol material to a mold apparatus (26), and a bink air-actuated gun (27) to convey the material from the conduit (28) into the

mold (26), wherein the average diameter of pipe (18) relative to pipe (28) is in a ratio 2:1. The diameter of the pipe (18) indicates the mean average of pipe diameter between the reactor and the pipe, and the diameter of the pipe (28) indicates the mean average of pipe diameter between the mold apparatus and the pipe. Therefore, the diameter of the pipe (18) is greater than the diameter of the pipe (28) and the ratio of the mean average pipe diameter between the reactor and the pipe and the mean average pipe diameter between the mold apparatus and the pipe is in the range of 1:1 to 10:1.

Furthermore, Walter et al. ('762) teach the difference between the pipe diameters between the pipe (18) and the pipe (28) provides a pressure differential between the tower and the mold for uniform filling of the mold. (See lines 27-38, column 1)

Therefore, it would have been obvious for one of ordinary skill in the art at the time of applicant's invention to modify the combined teaching of Yamamoto ('828) in view of Cleland (US '664) through providing a piping system in which the mean average of pipe diameter at the connection between the reactor and the piping system is equal to or greater than the mean average of pipe diameter at the connection between the mold and the piping system with a ratio in the range of 1:1 to 10:1 in order to provide a pressure differential between the tower and the mold for uniform filling of the mold, as suggested by Walter et al. ('762)

Claim 2 recites "at least one reactor is suitable for a reaction at a pressure in the range from 0 to 3 MPa and at a temperature in the range from 100 °C to 300 °C" (see lines 2-4) which is related to the operation of the claimed apparatus. Furthermore, **claim 3** recites "a conveying device suitable for moving the melt of the thermoplastic polymer in a longitudinal direction of the piping system". Moreover, **claim 7** recites "to allow the melt to flow from the direction of the at least one reactor in the direction of the at least one apparatus" (see lines 3-5); also, recites "to allow the melt to flow from the direction of the at least one apparatus in the direction of the at least one ractor" (see lines 6-7) which are related to the process steps of using the claimed apparatus.

All of the above recitations are directed to the intended use of the claimed apparatus.

Intended use has been continuously held not to be germane to determining the patentability of the apparatus, *In re Finsterwalder*, 168 USPQ 530.

The manner or method in which a machine is to be utilized is not germane to the issue of patentability of the machine itself, *In re Casey*, 152 USPQ 235,238.

Purpose to which apparatus is to be put and expression relating apparatus to contents thereof during intended operation are not significant in

determining patentability of an apparatus claim, *Ex parte Thibault*, 164 USPQ 666.

A recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations, *EX parte Masham*, 2 USPQ2d 1647.

Claims 9-13 are rejected under 35 U.S.C 103(a) as being unpatentable over Yamamoto ('828) in view of Fields et al. ('805), and further in view of Cleland (US '664)

Yamamoto ('828) discloses a method for producing polymeric articles by using polymers from a raw material monomer in a batch process (See abstract and paragraph [0002]) in which the process include the steps of preparing a melt of batch-wise monomers in a reactor (1) (See paragraphs [0002] and [0009] - [0010]), and also a step of feeding the melt of the thermoplastic polymer into the piping system (6) to move the melt towards the mold. Further, Yamamoto ('828) teaches the step of introducing the melt of the polymer from the piping system into the pelletizer (4) as a mold for producing polymeric articles. (See paragraphs [0009] - [0011]) Furthermore, Yamamoto ('828) discloses the monomers which were applied to the system are hexamethylenediamine (See paragraphs [0014]) or hexamethylene dianmonium. (See paragraphs [0016]). Also, the prior art teaches the polymer is taken continuously from the piping system. (See paragraphs [0002] – [0003])

Furthermore, Fields et al. ('805) disclose the monomer is melted inside of the reactor (1) and is introduced into the piping system at the melted temperature of the monomer. (See paragraphs [0003] - [0004]).

However, Yamamoto ('828) fails to teach a mean average wall shear rate in the range of 0.1 to 100 s^{-1} and a mean average flow velocity in the range of 0.1 to 100 cm/s for the molten polymer; further, Yamamoto (JP '828) fails to teach the piping system forms a circuit, as claimed in claim 9.

In the analogous art, Fields et al. ('805) discloses a process for the formation of optical plastic sheet in a continuous fashion in which the process include the step of delivering the molten polymer from a source (10) to an overflow die (20) via channel (12) where it is introduced to the die (20). Further, the prior art teaches the molten plastic has a shear rate of 10 $\sec^{-1}$ and a flow rate in the range of 1.0×10^{-3} to $10 gr/s/cm$ which clearly suggest a flow velocity of 0.1 to 100 cm/s. (See lines 58-67, column 3 and lines 60-67, column 5).

In another analogous art, Cleland (US '664) teaches a process for preparing a polymerization of vinyl aromatic compounds in which the process steps are operated through an apparatus comprising a heater pipe (6), a cooler pipe (7), and pipes (8, 9, and 11), all together, as a circuited piping system, a circulating pump as a conveying device, a hopper (18), a vibrat-able chute (19), a storage tank (15), a flow meter (17), a valve line (16), a mixing funnel (14) as a reactor connected to the piping system circuit through an input line (13), and a

cooler (20) with a filter (21) which are connected to the piping system through draw off line (12). (See lines 33-75, column 4 and figure 1)

Furthermore, Cleland (US '664) teaches the advantages of providing a piping system circuit in order to provide a uniform agitation at a sufficient time to convert all of the monomers to high molecular weight polymer during polymerization process. (See lines 33-45, column 4)

Therefore, it would have been obvious for one of ordinary skill in the art at the time of applicant's invention to modify teachings of Yamamoto ('828) by providing a mean average wall shear rate in the range of 0.1 to 100 s^{-1} and a mean average flow velocity in the range of 0.1 to 100 cm/s for the molten polymer in order to decrease the residual stress and increase the surface quality of polymeric article, as suggested by Fields et al ('805).

Furthermore, it would have been obvious for one of ordinary skill in the art at the time of applicant's invention to modify the apparatus for producing shaped bodies as taught by combined teachings of Yamamoto (JP '828) in view of Fields et al ('805) through providing a circuited piping system in order to provide a uniform agitation at a sufficient time into the melt of monomers to convert all of the monomers to high molecular weight polymer, as suggested by Cleland (US '664).

Moreover, in respect to the recitation "ISO 11357-1 and 11357-3" and 11357-3" in claim 12, line 5, the use of the trademarks are not permitted in the claims; see *Ex parte Simpson,* 218 USPQ 1020.

Response to Arguments

Applicant's arguments with respect to claims 1-13 have been considered; however, applicant's arguments in respect to the new amendments to claims 1 and 9 which adds new limitation of “which comprises at least one pipe which forms a circuit" are moot in view of the new ground(s) of rejection.

Applicant's arguments filed on 07/23/2008 have been fully considered but they are not persuasive.

Applicant’s argue that "the teaching of Yamamoto et al. (JP 09/020,828) arguing, inter alia, that the cooling system (6) of the prior art apparatus met the requirements of the piping system (b) specified applicant’s claims. Applicants respectfully disagree.” (See remarks, page 3, lines 34-35 and page 4, lines 1-3) and “In particular, the reference fails to suggest or imply that the cooling system comprises at least one pipe which forms a circuit." (See remarks, lines 9-11)

This is not found persuasive because, as recited in the above rejection, Yamamoto et al. (JP ‘828) anticipates the apparatus structure, as claimed in claims 1-2 and 4, and further the prior art teach a batch-type polymerization apparatus (20) for the production of polymer in which the apparatus include a polymer reactor (1) for the batch-wise preparation of a thermoplastic polymer melt, and a pelletizer device (4) as an apparatus for the production of polymeric pellets from the melt of a polymer; Furthermore, Yamamoto et al. (JP ‘828)

teach a cooling pipe (6) for transferring the polymer (See paragraphs 9 and 10 and figure 1) in which by consideration of the Yamamoto et al. (JP '828) disclosure, it is clear that the cooling pipe (6) has the structural limitations of a piping system. Furthermore, applicant's attention is drawn to the point that the claiming of the new use, new function, or unknown property which is inherently present in the prior art does not necessarily make the claim patentable, *In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977).*

In respect to the prior art of record, Fields et al. (US 6,224,805), applicants argue that "it is noted that the "overflow" which is designated as (24) and (25) in figure (4) of the reference is not conveyed via a pipe but merely indicates a melt flow covering the surface formed by the exterior of the die (20)." (See page 5, lines 3-6)

This is not found persuasive because applicant's attention is drawn to the point that, as recited above in the body of the rejection, Fields et al. (US '805) teach an apparatus for the formation of optical plastic sheet in a continuous fashion from molten polymer in which the apparatus include a source (10) as a reactor, a channel (12) as a piping system, and an overflow die (20) and guiding means (31, 32, 33, and 34) as a shaping apparatus wherein the piping system (12) is connected to the reactor (10) and the shaping apparatus (20) and also the piping system (20) is located there between. Fields et al (US '805) disclosure clearly teaches an apparatus which include a channel

(12) as a piping system. (See lines 58-67, column 3 and lines 1-11, column 4, and figure 2). Therefore, applicant's argument for this matter is not on point.

Applicant's argue that "the disclosure of Rawlings et al is not deemed to provide for a piping system which is connected to a reactor and an apparatus corresponding to the elements (a) and (c) of applicants' claims, and which comprises at least one pipe which forms at least one circuit" (See remarks, page 5, lines 26-30)

This is not found persuasive because applicant's attention is drawn to the point that Yamamoto ('828) has not been used alone for rejection of claim 5, but it is a combination rejection made over Yamamoto (JP '828) in view of Rawlings et al. (US '138). Yamamoto (JP '828) in view of Rawlings et al. (US '138), as recited in the above rejection, clearly teach an apparatus for producing shaped bodies from with a thermoplastic polymer melt in which the apparatus is in a spinning apparatus. Furthermore, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). (07-37-13)

Moreover, applicants argue that neither the teaching of Yamamoto et al. nor either one of of Walter et al. and Fields et al. can be deemed to provide for a piping system which is located between a reactor and an apparatus corresponding to the elements (a) and (c) of claim 1. (See page 7, lines 27-31)

This is not found persuasive because as mentioned earlier Yamamoto et al. teach a batch-type polymerization apparatus (20) for the production of polymer in which the apparatus include a polymer reactor (1) for the batch-wise preparation of a melt of thermoplastic polymer, and a pelletizer device (4) as an apparatus for the production of polymeric pellets from the melt of a polymer; Furthermore, Yamamoto et al. (JP '828) teaches a cooling pipe (6) for transferring the polymer (See paragraphs 9 and 10 and figure 1) in which by consideration of Yamamoto et al. (JP '828) disclosure, it is clear that the cooling pipe (6) has the structural limitations of a piping system.

Furthermore, Fields et al. ('805) teaches an apparatus for formation of optical plastic sheet in a continuous fashion from molten polymer in which the apparatus include a source (10) as a reactor, a channel (12) as a piping system, further, an overflow die (20) and guiding means (31, 32, 33, and 34) as a shaping apparatus wherein the piping system is connected to the reactor (10) and the shaping apparatus (20) and also the piping system is located there-between and further, a delivery means (14) as a conveying device which moves the polymeric melt between the reactor (10) and overflow die (20). Furthermore, the prior art teaches the shaping apparatus (20) with guiding means (31, 32, 33, and 34) are an apparatus for producing a plastic film. (See lines 58-67, column 3; and lines 1-11, column 4; figure 2)

Therefore, both Yamamoto et al. (JP '828) and Fields et al. ('805) provide a piping system which is located between a reactor and an apparatus

corresponding to the elements (a) and (c). Moreover, applicant's attention is drawn to the point that the disclosure of the reference Walter et al. has not been used for the rejection of claim 1.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Masoud Malekzadeh whose telephone number is 571-272-6215. The examiner can normally be reached on Monday – Friday at 8:30 am – 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven P. Griffin, can be reached on (571) 272-1189. The fax number for the organization where this application or proceeding is assigned is 571-272-8300.

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9197 (toll-free). If you would like assistance form a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. M. M./

Examiner, Art Unit 1791

/SEYED M MALEKZADEH/

Examiner, Art Unit 1791

/Carlos Lopez/

Primary Examiner, Art Unit 1791